

## ASYMMETRIC INFORMATION IN INSURANCE FIELD: SOME GENERAL CONSIDERATIONS

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*ABSTRACT: Our review aims to assess theoretical and empirical studies concerning the existence, magnitude and threats of information asymmetry in insurance field. Based on the fact that most of the papers examined approached both static and dynamic frameworks, a particular emphasis is put on the testable consequences that can be derived from existing models as documented in the literature. The importance of the present study relies in the assessment of the consequences of information asymmetry, which importance increased in the last years. Based on the results documented by previous studies, we argue that neither the existence nor magnitude can be easily assessed without a lack of consensus. In this respect we consider the threat regarding information asymmetry in the insurance market as being not thoroughly founded. We also tried to identify based on our understanding the causes for inconclusive results obtained so far in the literature.*

*Key words: asymmetric information, inconclusive results, biases, adverse selection, moral hazard*

*JEL codes: G11, G22, D82*

### Introduction

Insurance industry is considered to be one of the most important sources contributing to the economic prosperity today. Taking this into account any anomaly that has the potential to raise questions regarding the good functioning of this industry should be taken into consideration and assessed. One of the items that conducted to various discussions regarding the insurance market functioning is information asymmetry.

Approaching the importance of information asymmetry in the insurance field, Hubbard (1990) asserted that it has the potential to conduct to market failures and create inefficiency both at micro and macro level.

Determining information asymmetry in practice is a not an easy task. The problems created by asymmetry information in insurance field are not new and certainly are going to be an important research direction in the future also since the known impact for pricing, contract design and regulation (see, e.g. Einav et al., 2010; Kau et al, 2012; Chiappori and Salanie, 2012; Spindler, 2012).

The literature approaching the information asymmetry consequences for insurance field can be broadly divided in two segments. One segment comprises the theoretical developments of the asymmetry information theory since it was first elaborated by Akerlof in year 1970. One important item included in this segment is also the basis of our concern. The adverse selection and moral hazard occurrence and the magnitude of the riskiness of the models developed for assessing the insurance field. Those informational problems have the potential to lead to the lack of market

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equilibrium either simultaneously or separately. That is why the studies assessed for information asymmetry had to comprise both moral hazard and adverse selection.

The second segment comprise the empirical developments of the theory of asymmetric information and in insurance field this segment deals primarily with the coexistence of the informational problems as the ones described above. The start in the empirical segment was given by the work of Puelz and Snow (1994), which tested for the presence of adverse selection using the conditional correlation approach in the USA automobile insurance field. Since the authors documented positive results a new spring of research aroused. Based on this particular study, other empirical studies have been conducted in order to assess the existence of information asymmetry with the informational problems and consequences attached (Fagart and Kambia-Chopin, 2003; Chassagnon and Villeneuve, 2005; Julien et al., 2007).

The purpose of this paper is to inform the reader with a good overview regarding the information asymmetry existence, magnitude and consequences documented in previous studies. Based on the fact that studies concerning information asymmetry existence and magnitude documented so far inconclusive and contradictory results, our study is relevant and timely significant. The majority of the studies comprised so far in the insurance field approached the negative consequences of information asymmetry, lacking to concentrate in thoroughly examine primarily its existence.

The research design is focused on the following: the study is conducted in a form of thematic literature review; problem based design and is future research oriented. Based on our knowledge our literature review study is the first one dealing with the assessment of the existence and magnitude of information asymmetry in the insurance field.

In order to gain a broader understanding over the topic researched, we used also theoretical developments from other fields of study (e.g. economics). Also, the empirical validation of the theoretical developments approached is part of the scope of this study. The intended audience for our paper is mostly formed by scholars and practitioners wishing to familiarize with the concepts discussed and with the latest research conducted in the field, regarding the existence and magnitude of information asymmetry.

The rest of the paper is organized as follows. Section 2 summarizes the theoretical developments and key concepts of the information asymmetry theory in order to sustain our research question. In section 3 we briefly describe the methodology employed in our study while section 4 comprises the main application of the theory in the empirical studies conducted over time in the field of economics mainly in the insurance field. Lastly, in section 5 we draw our conclusions and discuss briefly about the main limitation of the study and the future directions of research.

### **Theoretical developments regarding information asymmetry**

The work conducted by Rothschild and Stiglitz (1976) on competitive insurance market with adverse selection documented that equilibrium may not exist. Also when dealing with moral hazard occurrence the conclusion is similar. Both are part of information asymmetry segment of research and deals with the market behavior.

Since the first theory developed by Akerlof (1970) on information asymmetry that included adverse selection and moral hazard and until today the literature expanded extremely fast. His genesis paper that later would comprise one of the most cited theories in economic field, was entitled "*The Market for 'Lemons': Quality Uncertainty and the Market Mechanism*". The basic argument comprised, was that in many markets the buyer uses some market statistics in order to measure the value of a certain class of goods. In this respect the buyer observes the average of the whole market while the seller has more intimate knowledge of a specific item or good on the market that he/she intends to purchase. Further, Akerlof (1970) argues that is the information

asymmetry that gives the seller an incentive to sell goods of less than the average market quality. The title of this paper that made history in economics comes from the example comprised and is related to American automobile industry. The author assume that there are four types of cars in the automobile market, new cars and old ones and both can be either good or bad (e.g. the bad cars in USA are called under the name of “lemons”). The reasoning of the author was the following: when buying a car, statistically the probability to buy a good car is noted with  $l$ , while the probability to buy a bad car is noted with  $q-l$ . This hypothesis is valid both for new cars and old cars. What makes this statistical property to change is the information set that is comprised in each action undertaken in the economic field by its actors, known under the name of asymmetric information, when one part of the market has information while the other part of the market do not.

The main conclusion of the paper is that private information has the potential to lead to malfunctioning of markets and is connected to the magnitude of occurrence and far-reaching consequences. The paper comprises the fact that adverse selection can explain many economic institutions. What first was more likely a prophecy, today it has come true and as consequence a whole body of literature springs with the scope of assessing the consequences of information asymmetry. In this respect, for more than two decades, research on incentives and market equilibrium situations with information asymmetry has been a prolific part of economic literature (Friedman and Hawkins, 2010) since information asymmetry existence was tested and discussed extensively.

Based on the fact that the theory was developed in the economic field, later on, two other theories were assessed in connection. Being elaborated earlier, the agency theory comprised elements of asymmetry of information based on the fact that the benefit of companies' stockholders and their contractual agents are not always convergent. The latter category will have always more information than the first one. Further the theory of incomplete contracts used as foundation the theoretical developments of the first two and comprises items of information asymmetry when explained the reasons why some of the contracts are left “incomplete” in order for not to explicitly present some rights. In this case the asymmetry of benefits is included as a distinct segment in information asymmetry research area.

Influenced by the contract theory, the information asymmetry theory approached features that must be understood earlier to any attempt to quantify their empirical importance, which can be the case of its two polar segments. In this respect, the studies on adverse selection documented that in most theoretical models of insurance under adverse selection, the subscriber is considered to have superior information. The presumption is that usually the insurer has better information compared with the information of the insured (Pouyet et al., 2008). The same remark applies when models comprise both adverse selection and moral hazard (Villeneuve, 2003; Julien et al., 2007).

Such asymmetries had and still have the potential to give rise to a number of significant questions. A simple one is related to the following: *what happens with the prices of the traded insurance policies if one side of the market is better informed? It is possible for better informed agents to improve their individual market outcomes?* Trying to answer to similar questions in insurance field, the empirical studies made possible a clearly distinguished path from theoretical developments in information asymmetry that later was known in the literature under the gap between theoretical and empirical studies. This particular gap in recent years is becoming narrower (Cohen and Siegelman, 2010), but still more research must be conducted in order to narrower it more. This study is also looking to contribute to this demarche.

Based on the above we developed the following research questions:

- *Is information asymmetry existence and magnitude documented in the insurance field literature free of bias?*
- *Are the threats regarding information asymmetry in the insurance field real?*

Through the above research questions we intent to draw attention to the consequences of information asymmetry effect in the insurance market if its existence can be thoroughly documented in the literature. For a facile understanding we developed the research path by comprising empirical developments approached in the discussion segment.

### **Methodology**

Our research is a fundamental one aiming to construct an internal history of the literature of information asymmetry existence documented in the insurance field based on the view of Ryan et al. (1993). In this respect our goal was to identify the main authors that have contributed significantly to documenting the existence and magnitude of information asymmetry through adverse selection and moral hazard in the insurance field.

Our literature review is a thematic one, the studies and authors that formed the sampling of the literature were selected only with the scope of assessing our research questions described above. The methodology adopted was inductive and the conclusions were drawn based on the selected sampling of the literature. The latter was constructed based on the number of citations and journals rankings, in order to assess and analyze papers with impact results for this particular field. In order to identify all relevant literature, the literature search included the following steps:

1. Keyword search using Business Source Complete database,
2. Identification of publications citing the key publications under a thematic view.

We excluded from our search the review of conferences, book chapters and unpublished work. All papers included in our sample are comprised in Table 1.

The first article included in our sample (that can be seen in the table below) was the study conducted by Puelz and Snow (1994), based on the fact that this is the first empirical study considered when testing for the presence of information asymmetry in the insurance field. Further, we selected all articles that approached the documented existence of information asymmetry with moral hazard and adverse selection from 1994 to 2012.

As final observation our literature review was concept-centric rather author-centric similar to Webster and Watson (2002). Also, it is out of the scope of this paper to develop a theoretical framework, so the literature review process was not conducted with reference to such theoretical framework.

### **Findings – Discussions based on empirical developments of information asymmetry theory**

According to information asymmetry theory, people deal with different levels of information, fact that further conduct to a behavior and sum of actions that can be characterized by important differences. Today, we are able to explain many common phenomena found in the insurance market based on this particular theory considered as being a valuable tool (Friedman and Hawkins, 2010).

While its effects are extensively discussed both in theoretical and empirical developments, its existence and magnitude is not a clear cut option. Even if when a positive correlation between risk and coverage was documented (conducting to the idea that the information asymmetry existence in the insurance market is documented), the research design and methodologies were challenged by further studies. In competitive markets this property is validated entailing heterogeneous preferences and multidimensional adverse selection combined with moral hazard. When imperfect markets were examined, the results documented that the correlation is validated if the agent`s risk aversion becomes public information (Jullien et al., 2007).

Taking into consideration the validity of the research designs used to test for the existence and magnitude of information asymmetry, many studies documented that the positive correlation

documented in previous studies is not without risk of error. Since many empirical studies succeeded to validate the existence of information asymmetry in the insurance market, other studies tried to prove that the correlation is not a strong one, demarche that until today comprises a lack of consensus.

As we stated above, our goal was to examine all the previous studies that documented either a positive correlation either negative and further to try to assess based on that the existence and magnitude of information asymmetry. We began our research demarche by taking into consideration the following fact: if information asymmetry has the potential to affect the market behavior than its simple existence documented can enhance out possibility of understanding the magnitude of the consequences derived. On the other hand, if its existence cannot be documented extensively, we cannot take into account the effects, consequences and threats involved.

Based on the theoretical developments, the empirical studies conducted so far included when testing for information asymmetry the distinction between the adverse selection and moral hazard. While the adverse selection implies that the riskier the agent is the larger the coverage he chooses, the moral hazard implies that the highest the coverage the policy holder chooses the lowest the level of preventive effort is.

The empirical methods used in order to examine the possibility of information asymmetry in insurance market used parametric and non-parametric measures, the first ones being the ones preferred by most of the researchers. Even if those methods are known of inserting important biases that had the potential to limit the validity of the constructions, they were extensively used every time when testing for information asymmetry and found positive. In order to understand the severe consequences of those methods Chiappori and Salanie (2000) opinion is representative: the consequences of parametric methods when testing for information asymmetry are severe in terms of validity of the results that suffer from functional and distributional form misspecifications.

The latter methods also were considered with severe biases attached since they comprise variables that must be transformed in binary variables, conducting in the end to an important loss of information that otherwise can be assessed and conduct to different results.

The empirical studies conducted so far succeeded to prove the existence of asymmetric information in the insurance market and further to document that this has the potential to affect the market equilibrium (Cohen, 2005; Grun-Rehomme and Benlagha, 2007). By separating the moral hazard from adverse selection, evidence of asymmetric information was documented also (Abbring et al., 2003; Dionne et al., 2004).

On the other hand, we can assert that various empirical studies documented the rejection of information asymmetry existence in the insurance field (Chiappori and Salanie, 2000). Being the fact that the opinions were contradictory, a study like the present one has the potential to bring interesting insights. Based on the opinion of Salanie and Chiappori (2000) and also Kim et al. (2009) who asserted in their studies that in general there is a tendency of absence of information asymmetry in the insurance field, we took into consideration to examine if there is a tendency of absence. Further, if so, the threats regarding insurance market equilibrium are without a clear cut foundation. Table 1, summarizes the main authors and segments of insurance where the existence of information asymmetry was tested. We summarized also the main findings and also when the results were not clear cut we specified it.

Table no. 1.

**Empirical applications of the information asymmetry theory and the documented results regarding the correlation between risk and coverage**

	<b>Authors</b>	<b>Year</b>	<b>Insurance segment</b>	<b>Positive/Negative correlation between risk and coverage*</b>
	Puelz, R, Snow, A.	1994	Automobile insurance	Positive
	Cawley, J., Philipson, T.	1999	Life insurance	Negative adverse selection
	Richaudeau, D.	1999	Automobile insurance	Negative (but not clear cut results)
	Salanie, B., Chiappori, P-A.	2000, 2006	Automobile insurance	Negative
	Cardon, J-H., Hendel, I.	2001	Health insurance	Negative
	Macho-Stadler, I., Perez-Castrillo, D.	2001	Mortgage insurance	Positive
	DeMezza, D., Webb, D.	2001	Insurance market	Negative
	Dionne, G., Michaud, P-C., Pinquet, J.	2001	Automobile insurance	Negative (but not clear cut results)
	Abbring, J-H., Neckmar, J-J., Chiappori, P-A., Pinquet, J.	2003	Automobile insurance	Positive
	Crocker, K., Moran, J.	2003	Life insurance	Positive
	Hendel, I., Lizzeri, A.	2003	Life insurance	Negative
	Finkelsten, A., Poterba, J.	2004	Insurance of annuities	Positive
	Dionne, G., Michaud, P-C., Dahchour, M.	2004	Automobile insurance	Positive
	He, B. (worked on Cawley, J. and Philipson, T., 1999 sample)	2009	Life insurance	Positive
	Cohen, A.	2005	Automobile insurance	Positive (but not clear results)
	Finkelsten, A., McGarry, K.	2006	Insurance of annuities	Positive
	Gjesdal, F.	2007	Mortgage insurance	Positive
	Grun-Rehomme, M., Benlagha, N.	2007	Automobile insurance	Positive
	Abbring, J-H., Chiappori, P-A., Zavadil, T.	2009	Automobile insurance	Positive
	Dionne, G., St-Amour, P., Vencatachellum, P.	2009	Automobile insurance	Positive
	Kim, H., Kim, D., Im, S.	2009	Automobile insurance	Negative (but not clear cut results)
	Saito, K.	2009	Automobile insurance	Negative (but not clear cut results)
	Gaumont, D., Zekri, M.	2010	Automobile insurance	Positive
	Cohen, A., Siegelman, P.	2010	Automobile insurance	Positive

	Gan, L., Huang, F., Mayer, A.	2011	Health insurance	Negative
	Spindler, M., Winter, J., Hagmayer, S.,	2011	Automobile insurance	Negative
	Spindler, M.	2012	Health insurance	Negative

Legend: \* A positive correlation between risk and coverage document the existence of information asymmetry in the insurance field. On the other hand, a negative correlation between risk and coverage document the absence of information asymmetry in the insurance field.

Source: Authors` projection

As it can be observed, the empirical applications of information asymmetry theory are not without lack of consensus as we asserted earlier. Despite the fact that various studies have been conducted in the area of insurance, until this moment there is still a strong lack of consensus regarding the presence of information asymmetry, adverse selection and/or moral hazard in terms of: existence, magnitude, potential consequences that can be assessed empirically. Based on these results we consider the threat of information asymmetry as not being a real one.

We began the internal construction of the literature with the study conducted by Puelz and Snow (1994) since this empirical study is considered to be the first one that form the basis for empirical literature on information asymmetry with moral hazard and/or adverse selection (Gaumont and Zekri, 2010). Since this particular study tested for the presence of adverse selection using the conditional correlation approach and their results did not rejected the information asymmetry, many empirical studies that were further conducted used this approach even if the subsequent works criticized the misspecifications found in this first model.

For instance the empirical study conducted by Cawley and Philipson in 1999 documented negative results of adverse selection while the study conducted by He (2009) and using the same sample of the previous, documented positive results. Based on the fact that each segment comprised in the insurance market have its own features, the empirical studies conducted concentrated on certain segments where asymmetric information was more documented using parametric and non-parametric tests. Being the fact that certain items were more vulnerable, the research questions had validity since certain segments (e.g. automobile insurance) offered the perfect basis for it. Taking into account this aspect, we also tried to assess studies from the same segment of insurance industry and the results were also positive and negative. In this respect the studies conducted by Cohen and Siegelman (2010) and also Spindler, Winter and Hagmayer (2011) comprised the strongest argument. While the first study documented for automobile insurance segment positive results of information asymmetry, the latter documented negative results and this example is not singular (e.g. above we discussed the contradictory results obtained by Cawley and Philipson (1999) and He (2009) when testing for information asymmetry existence using the same sample.

Overall, 55% of the studies included in our sample documented positive results when testing for information asymmetry while the rest documented negative results. 18% of the studies examined documented either positive either negative results when testing for the existence of information asymmetry in the insurance field, but the results were not clear cut.

Based on the positive results obtained by various studies presented above, the insurance market can be affected by the existence of information asymmetry. Based on the negative results when testing for information asymmetry, its existence cannot be documented and neither its magnitude.

Even if various studies documented the existence of information asymmetry taking into account the adverse selection and/or moral hazard, many others have documented its lack of existence. As far as we are concerned, the existence of information asymmetry in the insurance market is still unclear, since the results documented are negative and positive in the same magnitude. In this respect, we also can assert that the market equilibrium that is affected by

information asymmetry appear also not to be a clear cut in the literature. Many other empirical studies must be conducted in order to reach a consensus regarding the existence and impact of information asymmetry in insurance field.

### **Conclusions, limitation and scope for future research**

We asserted in the beginning of the paper that testing for the existence of information asymmetry is not an easy task and the lack of consensus in the results examining the existence of it in the insurance market is the perfect argument. By assessing previous empirical studies that examined the existence of information asymmetry, we concluded that the insurance market cannot document extensively that information asymmetry is or not a problem that has the potential to affect its equilibrium or efficiency. Further, being the fact that its existence is not under the aegis of a consensus, the discussions surrounding its implications remain without a clear basis.

In this respect both our research questions can have a pertinent answer. When dealing with the existence and magnitude of the information asymmetry documented in the insurance field, the results comprised in our sample are not without free of bias conducting to contradictory results and also inconclusive one. As a result, further we can argue that the threat of information asymmetry is not a real one for the insurance industry.

By reviewing the literature, we found the lack of consensus for the results documented like a leitmotif. Further, we tried to understand the genesis of the lack of consensus and the lack of clear cut results. In this respect we also contribute to the literature by identifying four directions used to explain why the results documented for this industry are inconclusive.

Based on our understanding the first direction can rely on the fact that when testing for its poles (e.g. adverse selection and moral hazard) researchers lack to take into account the inversed causality of them, even if they have similar empirical implications. In empirical studies that approached adverse selection, people possess different levels of ex-ante risk which further is translated into different post risk (e.g. accident rates). Based on the latter, different insurers will chose different contracts. When discussed about moral hazard, the agents first chooses different contracts and only after they are facing different incentive schemes they adopt a more or less cautious behavior that further can result in heterogeneous accident probabilities. Empirical studies approaching moral hazard documented that it occurs when the probability of a claim is not exogenous, but depends on some decision made by the subscriber (e.g. in case of the insurance field will be the effort of prevention). Both of the above poles approached in the literature when discussing information asymmetry introduce the choice of a contract that is correlated with an accident probability. More than that comprehensive coverage is associated with higher risk, even if both cases comprise controlling for observables.

The second direction can comprise the use of the parametric and non-parametric models when testing for information asymmetry, even if various researchers explained the severe biases introduced by those models. The third direction is dealing with the samples of the insurance market used by the researchers. Even if this market can offer the perfect ground in terms of number of variables used, researchers used simplified versions of the markets that further comprise only few players and states. In this respect the assumptions used become too simplistic compared with the complexity of the market, so scholars are trying to prove complex items by using only simplistic demarches. An example of the latter is the fact that the scholars, based on the assumptions of information asymmetry theory, assume that the buyers in insurance field always know the average values of the items on sale. This proposition could be valid but not always, typically in the cases when we are dealing with unique market items and in insurance those items are present in various cases.



The latter direction can comprise the use of cross-sectional data. Even if many studies were able to distinguish between adverse selection and moral hazard in static frameworks using cross-sectional data and further to document the existence of asymmetric information, we consider as being extremely difficult to distinguish between them under this kind of framework and further a research methodology that approach this research path can be flawed (Cohen and Siegelman, 2010).

The limitation of the study is related to our sample. Since we have conducted a thematic literature review, the sample is crucial, and we are aware of the fact that maybe some important studies were out of our scope based on the fact that from information asymmetry existence tested in insurance field we were interested only on adverse selection and moral hazard. In this respect, we have not introduced in our sample empirical studies that approached other key concepts of information asymmetry like: counteracting institutions, signaling or screening.

We intend to conduct a further study and to assess all the implications considered useful in the context of theoretical models and further to assess their applicability to actual market problems (e.g. insurance market was also affected by crisis). Also, we intend to find more analogies to information asymmetry in economics or other fields, both natural and human sciences in order to contribute more to the theoretical development of the information asymmetry theory under an interdisciplinary approach.

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